AMENDMENTS TO THE CLAIMS

1. (Currently amended) A wing for use on a supersonic aircraft comprising: ~~a wing, wherein the wing further comprises:~~

an inboard section of the wing adjacent to the fuselage;

a central section of the wing outboard of the inboard portion;

an outboard winglet oriented anhedrally relative to a lateral axis of the supersonic aircraft and outboard of the central section of the wing;

a leading edge formed from leading edge segments on the inboard section, central section and outboard winglet, wherein the leading edge segments have mounted thereon leading-edge flaps; and

a control system operable to reposition the leading edge flaps to improve aerodynamic performance of the supersonic aircraft.

2. (Original) The wing of Claim 1, wherein the inboard section of the wing is oriented dihedrally relative to the lateral axis of the supersonic aircraft.

3. (Original) The wing of Claim 1, wherein the leading-edge flap of the central section of the wing comprises a Krueger flap and the leading-edge flap of the outboard winglet comprises a simple leading-edge flap.

4. (Original) The wing of Claim 1, wherein the outboard winglet increase ground effect during take off.

5. (Original) The wing of Claim 4, further comprising a nacelle, and wherein the outboard winglet provides positive wave drag interference with the nacelle.

6. (Original) The wing of Claim 1, wherein the leading edge flap of the outboard winglet provides roll control at supersonic conditions and directional control with proverse roll effects.

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7. (Original) The wing of Claim 1, wherein the wing further comprises trailing-edge flaps on one or more sections, and wherein the leading edge flaps are controlled in conjunction with the trailing edge flaps by the control system to reduce drag at subsonic cruise conditions.

8. (Original) The wing of Claim 1, wherein the leading edge flaps increase aft lift, reduce trim and vortex drag, and reduce the sonic boom signature of the supersonic aircraft.

9. (Original) The wing of Claim 1, wherein the control system couples to the leading edge flaps and adjusts the leading-edge flaps to improve aerodynamic flow fields for flight at Mach numbers different from the Mach number to which the aircraft design is optimized.

10. (Original) The wing of Claim 1, wherein a strake leading-edge flap repositions to deflect or reduce lift ahead of spillage at an off-design condition and maintain a low sonic boom signature.

11. (Original) An aircraft wing capable of coupling to an aircraft fuselage and having a leading edge, the wing extending inboard to outboard, comprising:

a strake capable of coupling to the aircraft fuselage and extending to the leading edge of the wing, the strake further comprising a leading-edge flap;

a Krueger flap coupled to the leading edge of an inboard portion of the wing adjacent the strake and having upper and lower surfaces, wherein the strake leading-edge flap operates as a leading-edge device that can be deflected to create an airflow field impinging on the Krueger flap to reduce or eliminate inboard vortices in an upper surface air flow field; and

an outboard winglet having a simple leading edge flap coupled to the leading edge of the outboard winglet, wherein the outboard winglet is anhedrally oriented relative to a lateral axis of the aircraft, and wherein the simple leading edge flap provides roll control and directional control for the aircraft.

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12. (Original) The aircraft wing of Claim 11, wherein the wing and strake form a swept wing that extends at least one sweep angle from the fuselage.

13. (Original) The aircraft wing of Claim 11, wherein the wing and strake form a swept wing that extends in a plurality of sweep angle segments from the fuselage, the sweep angle of the inboard portion of the wing differs from the sweep angle of the strake and outboard winglet.

14. (Original) The aircraft wing of Claim 11, wherein the outboard winglet increase ground effect during take off.

15. (Original) The aircraft wing of Claim 11, further comprising a nacelle, and wherein the outboard winglet provides positive wave drag interference with the nacelle.

16. (Original) The aircraft wing of Claim 11, further comprising trailing-edge flaps on one or more sections, and wherein the leading edge flaps are controlled in conjunction with the trailing edge flaps by a control system to reduce drag at subsonic cruise conditions.

17. (Original) The aircraft wing of Claim 11, wherein the leading edge flaps increase aft lift, reduce trim and vortex drag, and reduce the sonic boom signature of the supersonic aircraft.

18. (Original) The aircraft wing of Claim 17, wherein the control system couples to the leading edge flaps and adjusts the leading-edge flaps to improve aerodynamic flow fields for flight at Mach numbers different from the Mach number to which the aircraft design is optimized.

19. (Original) An aircraft comprising:

a fuselage;

an aircraft wing coupled to the fuselage and having a leading edge, the wing extending inboard to outboard, and wherein an inboard section of the wing

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proximate to the fuselage is oriented at a positive dihedral angle relative to a lateral axis of the aircraft;

a strake capable of coupling to the fuselage and extending to the leading edge of the wing;

a Krueger flap coupled to the leading edge of an inboard section of the wing adjacent the strake;

a leading edge flap coupled to the leading edge of the wing and extending outboard from a junction at the Krueger flap; and

an outboard winglet having a simple leading edge flap coupled to the leading edge of the outboard winglet, wherein the outboard winglet is anhedrally oriented relative to the lateral axis of the aircraft, and wherein the simple leading edge flap provides roll control and directional control for the aircraft.

20. (Original) The aircraft of Claim 19, wherein the wing and strake form a swept wing that extends at a sweep angle from the fuselage.

21. (Original) The aircraft of Claim 19, wherein the wing and strake form a swept wing that extends in a plurality of sweep angle segments from the fuselage, the sweep angle of the wing differing from the sweep angle of the strake.

22. (Original) The aircraft of Claim 19, further comprising a control system coupled to one or more of leading-edge flaps, capable of adjusting leading-edge surfaces to improve aerodynamic flow fields for flight at Mach numbers different from the Mach number to which the aircraft design is optimized.

23. (Original) A wing for use on a supersonic aircraft comprising:

a wing, wherein the wing further comprises:

an inboard section of the wing adjacent to the fuselage;

a central section of the wing outboard of the inboard portion;

an outboard winglet outboard of the central section of the wing, wherein the outboard winglet's moment from the supersonic aircraft's fuselage allows

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control surfaces of the winglet to be reduced in size relative to control surfaces inboard of the outboard winglet;

a leading edge formed from leading edge segments on the inboard section, central section and outboard winglet, wherein the leading edge segments have mounted thereon leading-edge flaps; and

a control system operable to reposition the leading edge flaps to improve aerodynamic performance of the supersonic aircraft.

24. (Original) The wing of Claim 23, wherein the inboard section of the wing is oriented dihedrally relative to the lateral axis of the supersonic aircraft.

25. (Original) The wing of Claim 23, wherein a sweep angle of the outboard winglet is less than a sweep angle of the central section of the wing.

26. (Original) The wing of Claim 23, wherein the outboard winglet increase ground effect during take off.

27. (Previously presented) The wing of Claim 23, wherein the leading edge flaps are repositioned by actuators directed by the control system.

28. (Original) The wing of Claim 27, wherein a dihedral angle of the inboard section and central section of the wing allows fuel stored within the inboard section and central section to be readily pumped.

29. (Original) The wing of Claim 28, wherein the outboard winglet has an anhedral angle between about 0° and 90°.

30. (Previously presented) The wing of Claim 29, wherein leading edge flaps rotate about an axis in the plane of the outboard winglet and normal to a longitudinal axis of the supersonic aircraft.

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31. (Previously presented) The wing of Claim 29, wherein the anhedral angle of the outboard winglet allows the dihedral angle of the inboard section and center section of the wing to be increased to minimize a sonic boom signature of the aircraft

32. (Currently amended) A wing comprising:

an inboard section of the wing adjacent to the fuselage, wherein the inboard section is swept at a first angle;

a central section of the wing outboard of the inboard portion, wherein the central section is swept at a second angle that is different than the first angle;

an outboard winglet oriented anhedrally ~~relative to a lateral axis of the supersonic aircraft and~~ outboard of the central section of the wing, wherein the outboard winglet is swept at a third angle that is different than the first angle and the second angle; and

leading edge flaps mounted on the central section and the outboard winglet.

33. (Previously presented) The wing of Claim 32, wherein the inboard section of the wing is oriented dihedrally relative to the lateral axis of the supersonic aircraft.

34. (Previously presented) The wing of Claim 32, wherein the leading-edge flap of the central section of the wing comprises a Krueger flap and the leading-edge flap of the outboard winglet comprises a simple leading-edge flap.

35. (Previously presented) The wing of Claim 32, wherein the wing further comprises trailing-edge flaps on one or more sections, and wherein the leading edge flaps are controlled in conjunction with the trailing edge flaps by the control system to reduce drag at subsonic cruise conditions.

36. (New) The wing of Claim 32, wherein the wing is coupled to a fuselage of a supersonic aircraft.

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